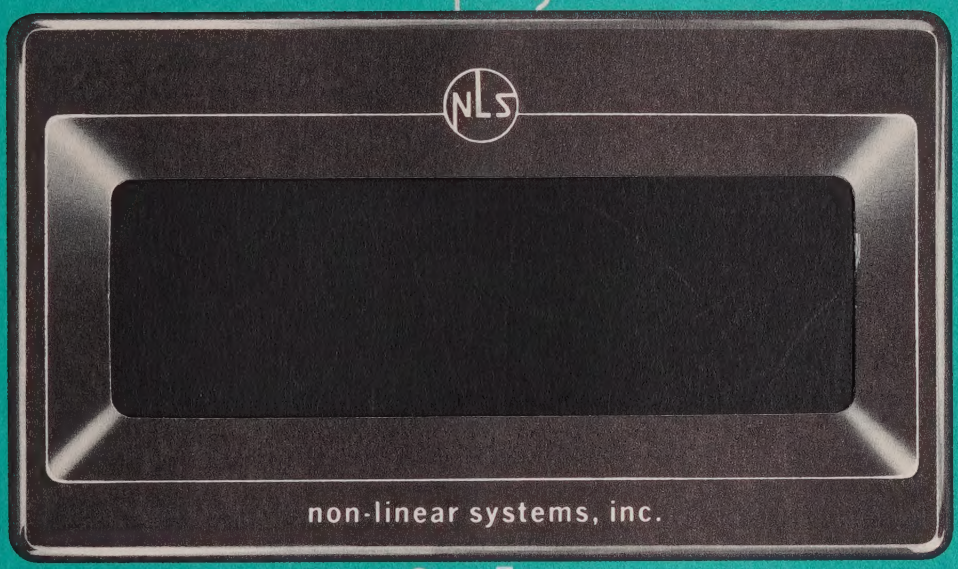


non linear systems, inc.

DEL MAR, CALIFORNIA

MODEL 5005
DIGITAL VOLTMETER
PRELIMINARY
INSTALLATION & OPERATION
HANDBOOK

June 1965

This handbook effective starting at Serial Number

Originator of the Digital Voltmeter

non-linear systems, inc.

Del Mar, California, Phone: (714) 755-1134 TWX: 714-277-3191

Printed in the United States of America

I INTRODUCTION

The Series 5000 Digital Voltmeters are low-cost tracking logic instruments which employ transistors and relays. The components of this instrument are enclosed within a double box; the inner box is electrically isolated from the outer box. In this way, a high common mode rejection capability is obtained. Except for the power transformer (which is of a special shielded design), all noise-sensitive components are located inside the inner box. This inner box is referred to as the "guard shield" in this manual. The electrical portions of the front panel controls are located inside of the guard shield area and are controlled by means of non-conducting shafts which extend to the front panel knobs.

Epoxy fiberglass rather than phenolic printed-circuit boards are used throughout the instrument to minimize circuit breakage caused by expansion and contraction. For additional mechanical and electrical stability, the Printact relays used in this instrument are mounted on individual circuit boards. These small relay boards are not subject to many of the mechanical stresses which act upon the larger component boards, and, therefore, the relay contact surfaces are more likely to stay in alignment. Electrical contact quality is assured, not only by alignment, but also by the use of precious metal contact surfaces on both the printed circuit board and relay contacts. The relays themselves are very conservatively rated by their manufacturer at 10 years use at one reading each twenty seconds per 8-hour day.

The readout is the time-proven NLS lucite-panel, edge-lighted type in which each decade is housed in a separate module. The lamps used in this readout have been expressly designed for use in NLS readouts to combine high brilliance with long life. Since the lamps operate at transistor voltages, there is no electrical shock hazard to the user. Detailed information about the readout is contained in the NLS Model 4W Readout Bulletin, a copy of which is available upon request.

Although this manual is generally applicable to all 5000 Series instruments, the operating instructions and calibration information fits most closely Models 5005 and 5010, the basic instruments in the Series. When needed, additional schematic drawings are supplied to cover other models or special instruments which have been ordered. Such drawings are ordinarily supplied as

folded, full-bluelines which are easily stored in the back of the manual.

If additional information is desired, please contact the nearest NLS Engineering/Service Center, or contact the main office. The last page lists the NLS offices.

II SPECIFICATIONS - Models 5005 and 5010

RANGES:	±9.999/99.99/999.9 volts DC for Model 5005, Model 5010 has an additional ±.9999 v range. AC, ohms, and DC measurements to ±10 μv can be made by using any of several NLS external converters which connect directly to the digital voltmeter.
RANGE & POLARITY SELECTION:	All ranges and polarity are automatically selected; the instrument will switch itself to the range required by the input signal value. The readout displays the polarity of the high (red wire) side of the input.
SPEED:	Average: under 800 millisec/reading. Worst Case: with range and polarity change: 2 sec/reading. Best Case: approx. 0.01 sec. per digit increase in rightmost window.
ACCURACY:	±(0.01% of reading +0.01% of full scale)
INPUT RESISTANCE:	Low Range: 1000 megohms. Middle and Upper Range: 10 megohms
COMMON MODE REJECTION:	106 db, min. at 60 cps with 1000-ohm source imbalance.
SIGNAL MODE NOISE REJECTION:	30 db, min. at 60 cps.
INPUT CONNECTION:	Amphenol type 97-3102A-14S-2P-426 connector is used on the dvm. The mate is Amphenol 97-3106A-14S-2S-426. The input signal pair is not connected to outer box; signal low is common with inner box. Input can float to 500 volts difference between inner and outer cases.
REFERENCE VOLTAGE SOURCE:	Internal, matched Zener diodes provide the digital potentiometer excitation voltage. Temperature control with an oven is not required.
DIMENSIONS:	5½" high, 13" deep (excluding connectors), 19" wide.
POWER SOURCE:	115 volts, 50-60 cps, 60 watts maximum power consumption. For 230 volt operation, the two primary windings of the power transformer must be wired in series instead of in parallel.

III INSTALLATION AND OPERATION

1. Unpacking

Instruments are shipped in two-piece polystyrene-bead containers. Cut the tape between the container halves and open. If damage is seen, promptly notify the carrier. No packing materials are used inside of the instrument and it is ready for use when taken out of the shipping container. It is suggested that the container be saved if the instrument is to be stored or shipped.

2. Power Source

The 5000 Series instruments are usually supplied for operation from 115-volt, 50-60 cycle power sources. However, these instruments will operate from 220-230 volt, 50-60 cycle sources if the two primaries of the power transformer are wired in series instead of in parallel. The Serial No. tag at the rear of the instrument indicates the correct power source voltage to be used.

3. Fusing

The instrument is protected by a 3AG one ampere slo-blo fuse which is located in an extractor post on the rear panel. When a 220-230 volt power source is to be used (and the power transformer primary rewired as indicated in Item 2, above), it is suggested that a half-ampere fuse be used to provide maximum protection.

4. Power Grounding

The third pin of the power plug grounds the outer chassis of the instrument. The internal guard shield box has no connection with power ground.

5. Cables

The instrument is supplied with an input cable, see Figure 1 for connection information. The banana plugs on the cable are color coded:

Pin A - red plug - signal high
Pin B - black plug - signal low
Pin C - yellow plug - inner guard shield of dvm
Pin D - blue plug - outer case of dvm

6. Controls

The number and type of front-panel controls used is determined by the instrument's measuring capability. However, the simplicity of operation is almost self-evident and little need be added to what is printed on the front panel of each

model. However, it should be observed that the POWER switch in its OFF position opens up both sides of the power line by means of a double-pole switch; at the same time, the power ground connection is maintained. The SENSITIVITY control should normally be kept in the full clockwise position to obtain the full specified resolution of the instrument. In the presence of a fluctuating input or signal noise, it may be necessary to back off the SENSITIVITY control just far enough for the readings to stabilize. When finished taking such readings, the SENSITIVITY control should again be returned to its full clockwise position.

7. Polarity and Range

The basic instruments in this Series, the Models 5005 and 5010 have neither a RANGE nor a POLARITY control since both functions are automatically provided.

IV RELAY HANDLING

Installing and Handling the 5000 Series Relays

Tests by NLS, several other companies and the relay manufacturer have shown that the printed circuit relays used in the 5000 Series instruments are very reliable units. For example, in the NLS life tests, the relays were operated for the equivanent of 20 years of dvm use at 2 seconds per reading, 8 hours a day, 7 days a week, and there were no failures.

To obtain the fullest measure of this reliability, the instructions below should be followed.

1. Do not attempt to adjust relay contacts. The relays are adjusted for correct contact pre-load at the manufacturer.

2. Do not trade contact assemblies from relay to relay. The manufacturer's contact pre-load adjustment takes into account manufacturing tolerances of the entire relay assembly.

3. Do not manipulate the contact assembly by hand. This may bend the contacts and change the pre-load setting.

4. Retain the plastic cover on the bottom of the relay until it is installed on a decade board.

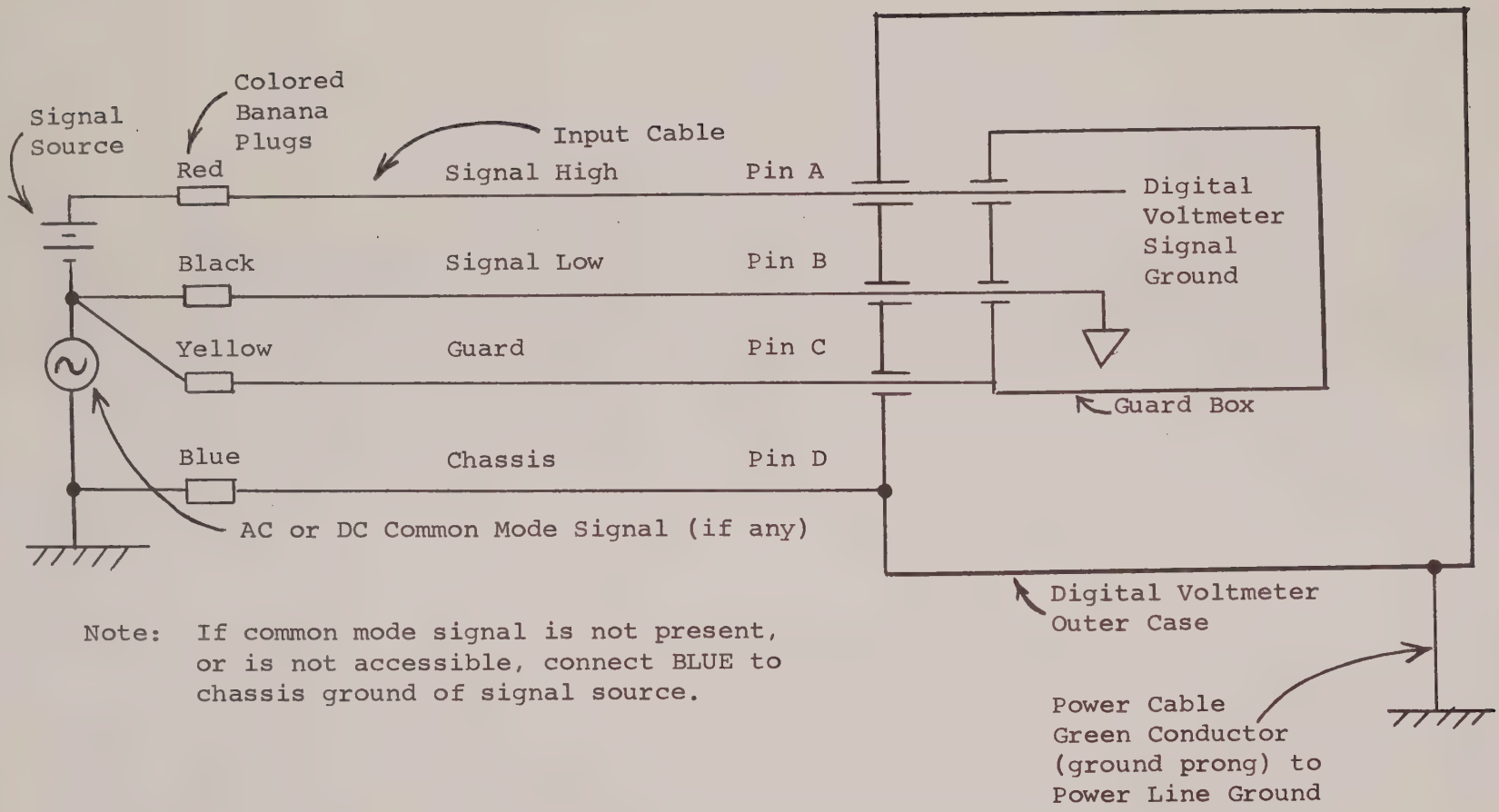
5. Remove rosin and degrease the relay contact printed circuit board before final installation of the relays. For removing contamination of organic origin, FREON is recommended. If means are taken to protect the plated printed circuit wires on the relay contact printed circuit board, rosin may be removed from the solder connections by blasting.

6. Do not handle the moving armature blades. This avoids contamination or bending blades out of adjustment.

7. Do not operate relay when not mounted on the printed circuit contact board. Back pressure on blades is required to start armature back into the magnetic field.

8. Contacts on relay and board can be cleaned by buzzing relay with AC current at rated voltage when mounted on the circuit board. This also assures proper seating of any armature dislodged in shipment.

9. Do not hand-adjust relay blades. The relays have been factory adjusted for the required overtravel and wiping action. If the relay does not operate for any reason, replace it with another relay.



Note: If common mode signal is not present, or is not accessible, connect BLUE to chassis ground of signal source.

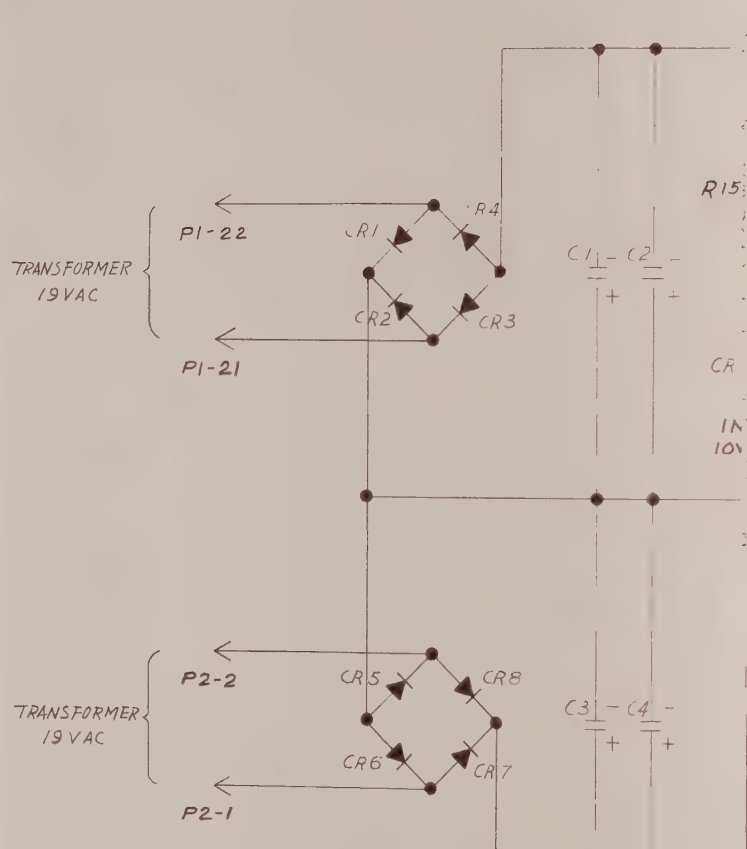
Figure 1. Input Connections for NLS 5000 Series Digital Voltmeter

D

C

B

A



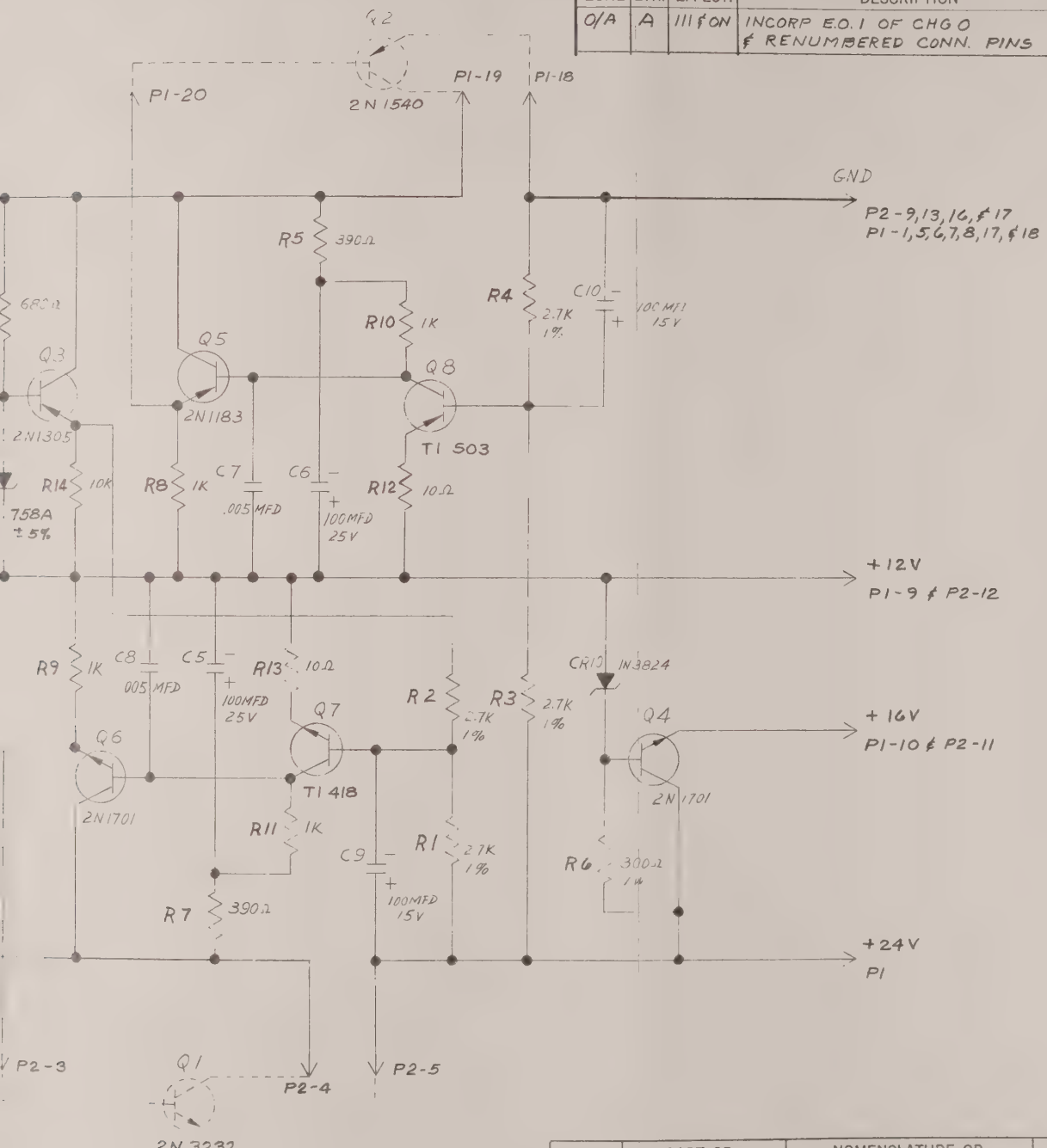
6. Q8- 2N3638 TRANSISTOR MAY BE USED IN LIEU OF T1503 PROVIDED A MIN BETA OF 60 IS MAINTAINED.
5. RESISTORS ARE ½ W. CARBON 5% TOL. UNLESS OTHERWISE
4. R1 THRU R4 ARE PW1220 1% W.W.
3. Q1 AND Q2 ARE MOUNTED ON INNER CHASSIS
2 C1 THRU C4 ARE 1000 MFD/25V
1. CR1 THRU CR8 ARE T14385 OR MOTOROLA IN4003

NOTES:

50-
NE
AS

10/64 DIETERICH-POST CLEARPRINT 1000H-10

REVISIONS					
ZONE	LTR.	EFFECT.	DESCRIPTION	DATE	APPROVED
0/A	A	111 ON	INCORP E.O. 1 OF CHG 0 & RENUMBERED CONN. PINS	5-13-65 & 5-27	R.T.W.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MFR. CODE	CIRCUIT REF.	ITEM NO.

PARTS LIST

7	50-17	1	1
KT Y.	FINAL ASSY.	NEXT ASSY.	FINAL ASSY.
APPLICATION		QTY.	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS ± .010 ANGLES ± 0° 30'
FRACTIONS ± 1/32

MATERIAL

CONTR. NO.

DRAWN	[illegible]	12-2-64
CHECK	[illegible]	2-2-65
APPR	[illegible]	2-2-65
RELEASE DATE	2-2-65 (E)	

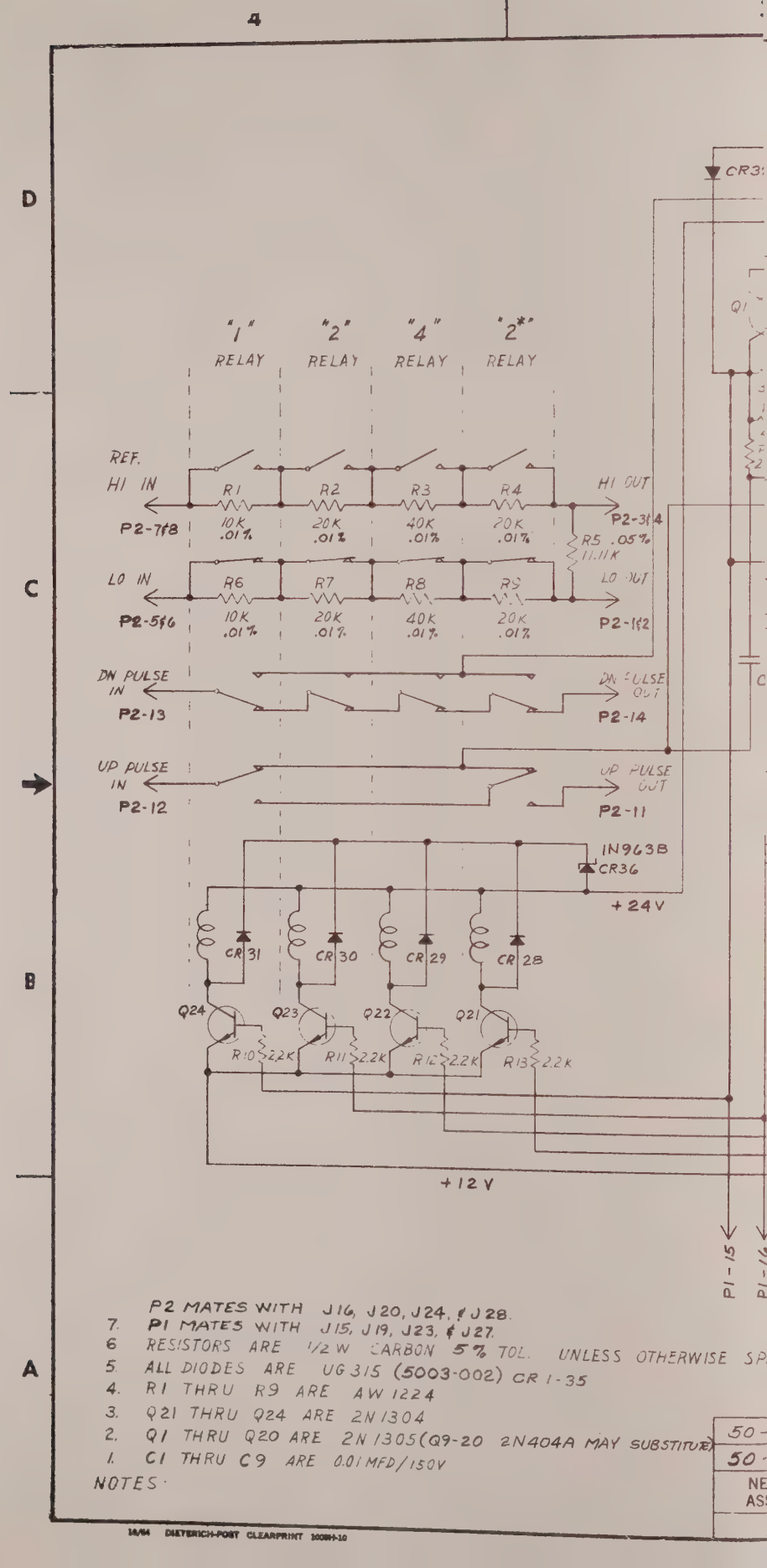
NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA

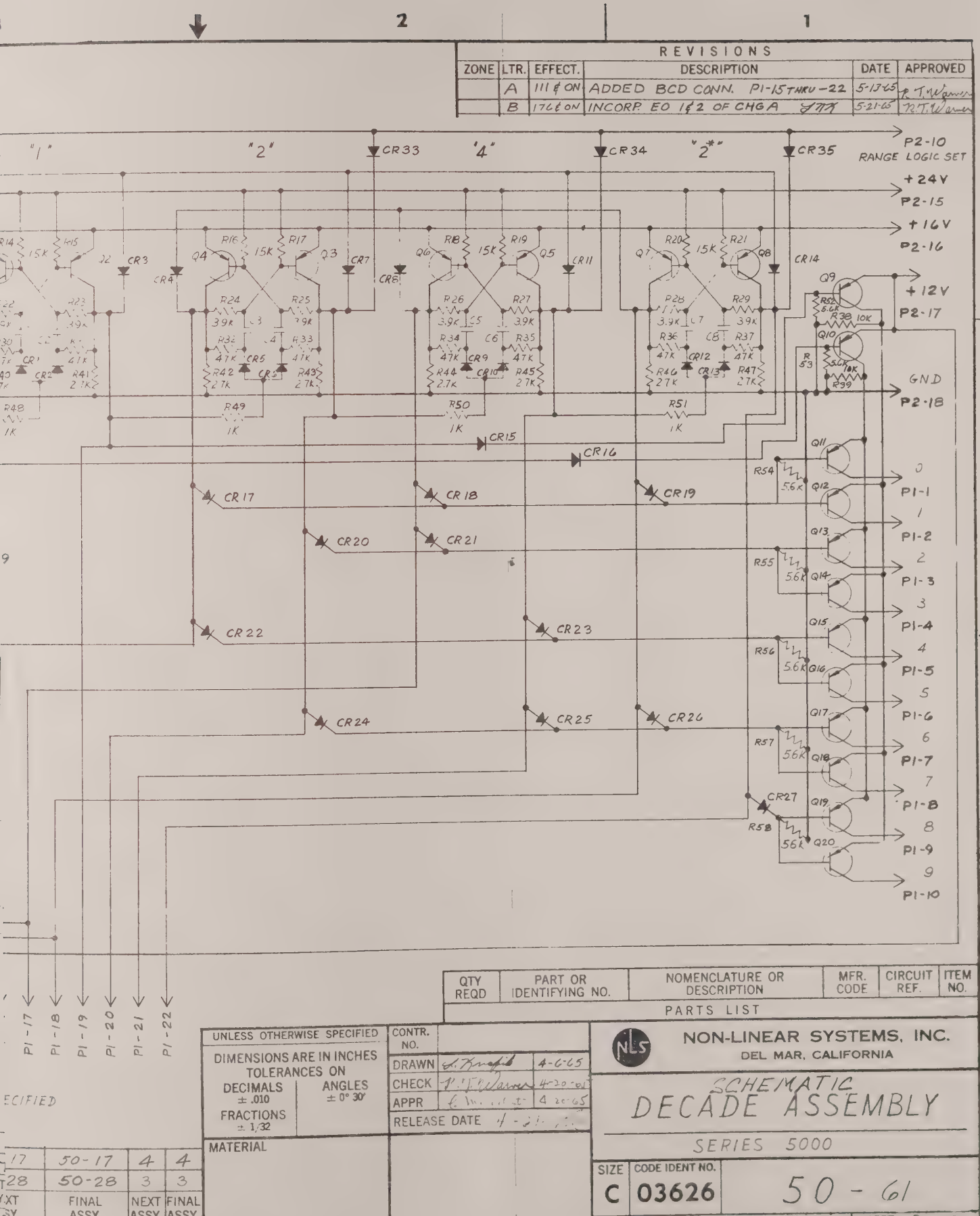
POWER SUPPLY ASSEMBLY

SERIES 5000

SIZE	CODE IDENT NO.	
C	03626	50-7
SCALE	WEIGHT	SHEET 2 OF 2

50-7 S/2


4
D
C
B
A
"1" RELAY
"2" RELAY
"4" RELAY
"2*" RELAY
REF.
HI IN
P2-7&8
R1 10K .01%
R2 20K .01%
R3 40K .01%
R4 20K .01%
R5 .05% 11.11K
HI OUT
P2-3&4
LO IN
P2-5&6
R6 10K .01%
R7 20K .01%
R8 40K .01%
R9 20K .01%
LO OUT
P2-1&2
DN PULSE IN
P2-13
DN PULSE OUT
P2-14
UP PULSE IN
P2-12
UP PULSE OUT
P2-11
IN963B
CR36
+24V
CR31
CR30
CR29
CR28
Q24
Q23
Q22
Q21
R10 2.2K
R11 2.2K
R12 2.2K
R13 2.2K
+12V
P1-15
P2 MATES WITH J16, J20, J24, & J28.
7. P1 MATES WITH J15, J19, J23, & J27.
6 RESISTORS ARE 1/2 W CARBON 5% TOL. UNLESS OTHERWISE SP
5. ALL DIODES ARE UG315 (5003-002) CR 1-35
4. R1 THRU R9 ARE AW1224
3. Q21 THRU Q24 ARE 2N1304
2. Q1 THRU Q20 ARE 2N1305(Q9-20 2N404A MAY SUBSTITUTE)
1. C1 THRU C9 ARE 0.01MFD/150V
NOTES:
14/64 DIETERICH-POST CLEARPRINT 100864-10


2
1
REVISIONS
ZONE | LTR. | EFFECT. | DESCRIPTION | DATE | APPROVED
A | 111 & ON | ADDED BCD CONN. P1-15 THRU -22 | 5-13-65 | R.T.Warner
B | 176 & ON | INCORP. EO 1 & 2 OF CHG A | 5-21-65 | R.T.Warner
"1"
"2"
CR33
"4"
CR34
"2*"
CR35
P2-10
RANGE LOGIC SET
+24V
P2-15
+16V
P2-16
+12V
P2-17
GND
P2-18
P1-1
P1-2
P1-3
P1-4
P1-5
P1-6
P1-7
P1-8
P1-9
P1-10
P1-17
P1-18
P1-19
P1-20
P1-21
P1-22
D
C
B
A
50-61 S/2
QTY REQD | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION | MFR. CODE | CIRCUIT REF. | ITEM NO.
PARTS LIST
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS ± .010
ANGLES ± 0° 30'
FRACTIONS ± 1/32
CONTR. NO.
DRAWN 4-6-65
CHECK 4-20-65
APPR 4-20-65
RELEASE DATE
MATERIAL
NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA
SCHEMATIC
DECADE ASSEMBLY
SERIES 5000
SIZE C
CODE IDENT NO. 03626
50 - 61
SCALE
WEIGHT
SHEET 2 OF 2
17 | 50-17 | 4 | 4
28 | 50-28 | 3 | 3
XT Y. | FINAL ASSY. | NEXT ASSY. | FINAL ASSY.
APPLICATION | QTY.

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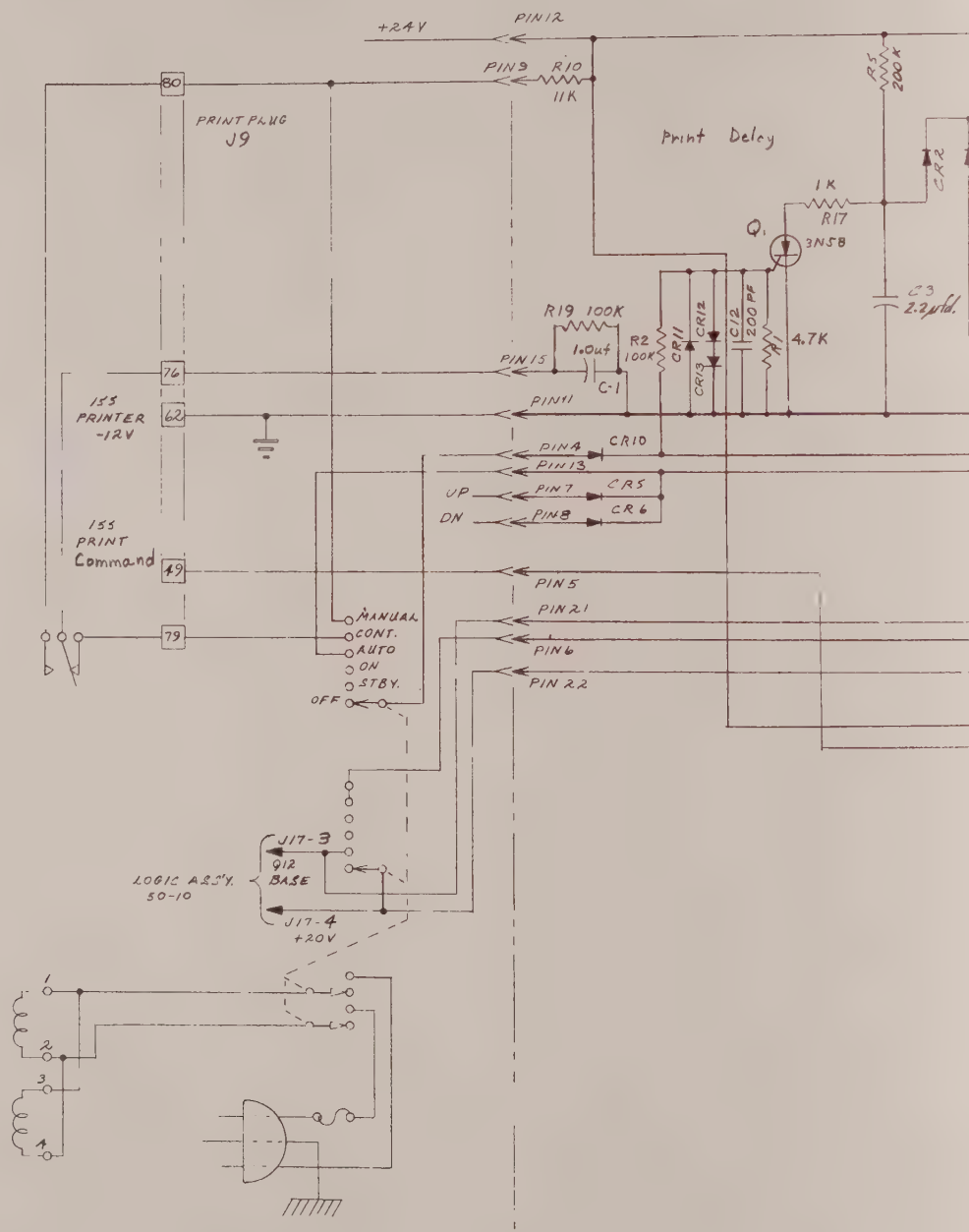


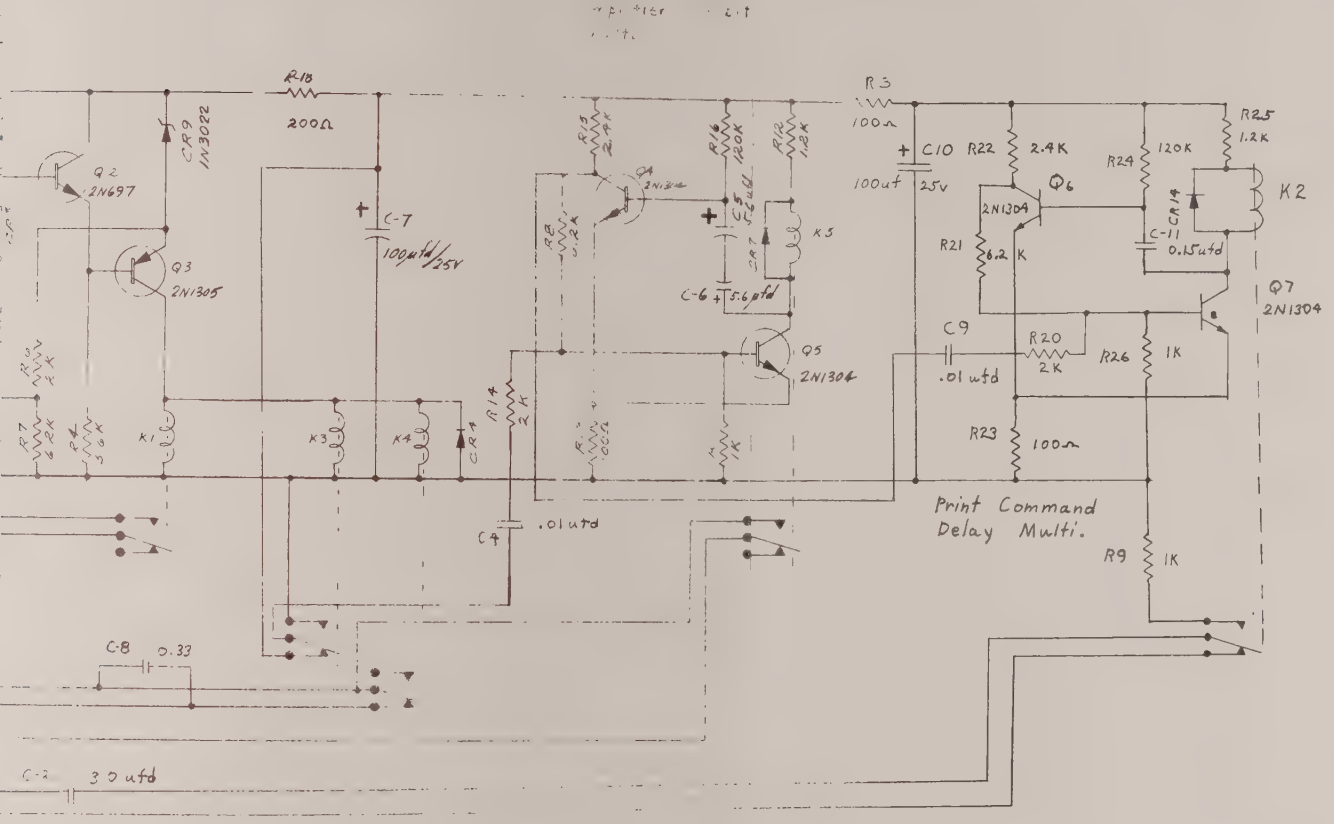
FOR REFERENCE ONLY

4. CR8 Omitted
3. ALL DIODES ARE NLS 5003-002
2. ALL RESISTORS ARE 1/2 W 5%
1. ALL RELAYS ARE NLS 5-12-34

NOTES, UNLESS OTHERWISE SPECIFIED.

DIETERICH-POST CLEARPRINT 1000M-10

REVISIONS					
SYM	ZONE	EFFECT.	DESCRIPTION	DATE	APPROVED
A			Added Print Comm. Delay Multi. Revised Print Delay Circuit	5-5-65	R.T.W.
B		1095 ON	INCORP EO. 1 OF CHG A	5-7-65	R.T.W.



50-67
SHEET 2 3

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MFR. CODE	CIRCUIT REF.	ITEM NO.	NEXT ASSY.	FINAL ASSY.	NEXT ASSY	FINAL ASSY.
		PARTS LIST				APPLICATION		QTY	
							50-79	1	1
							50-78	1	1

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS ± .010
ANGLES ± 0° 30'
FRACTIONS ± 1/32
SURFACE ROUGHNESS PER MIL-STD-10 ✓
DO NOT SCALE THIS DRAWING
RELEASE DATE 4-15-65(2)

DRAWN J. A. COMBS 3-9-65
CHECK [illegible] 4-13-65
APPR R.T. Warner 4-15-65
MATERIAL
FINISH

NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA

SCHEMATIC
"PRINT CONTROL" BOARD
5000 SERIES

CODE IDENT NO. 03626
SIZE D
50-67
SCALE
WEIGHT
SHEET 2 OF 2

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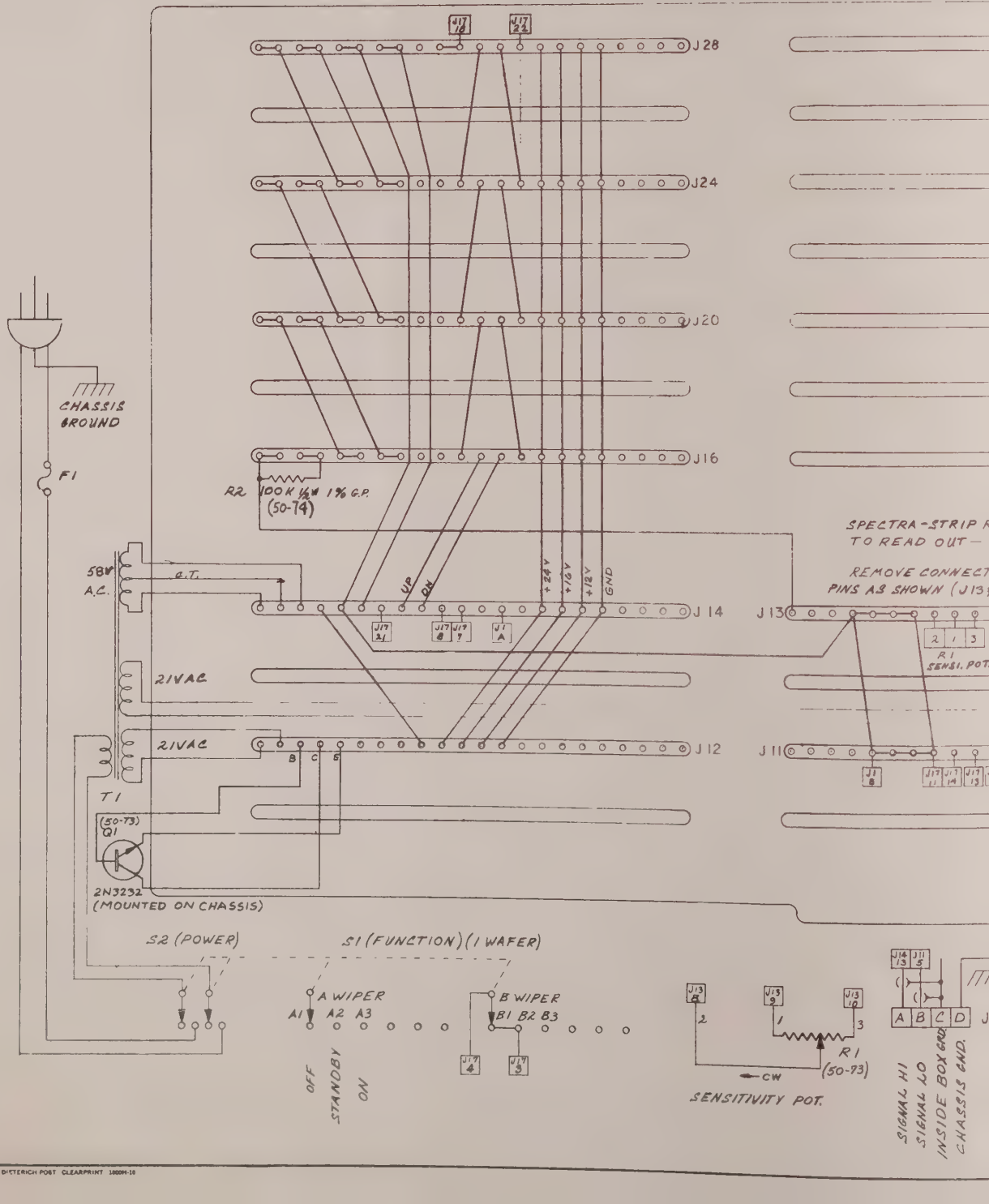
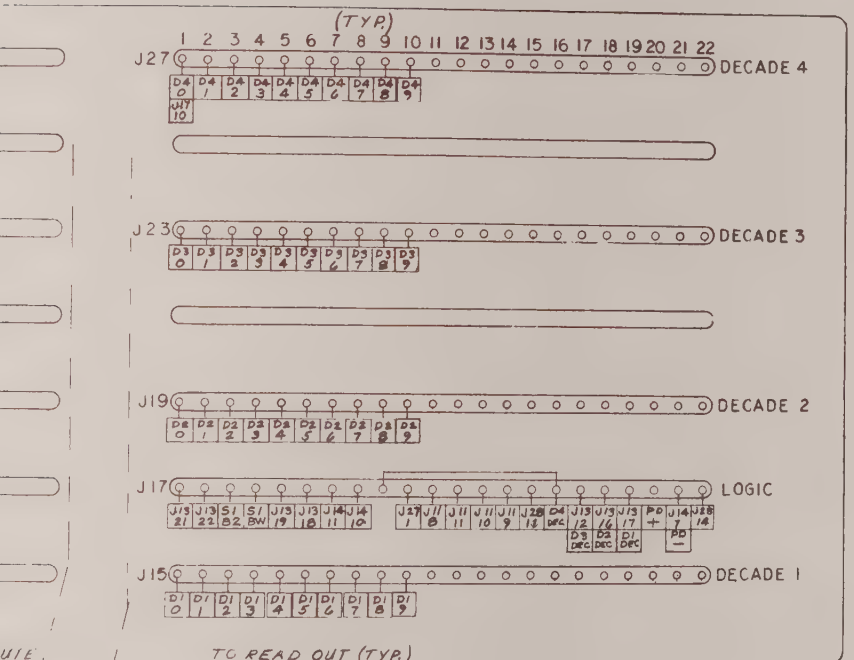
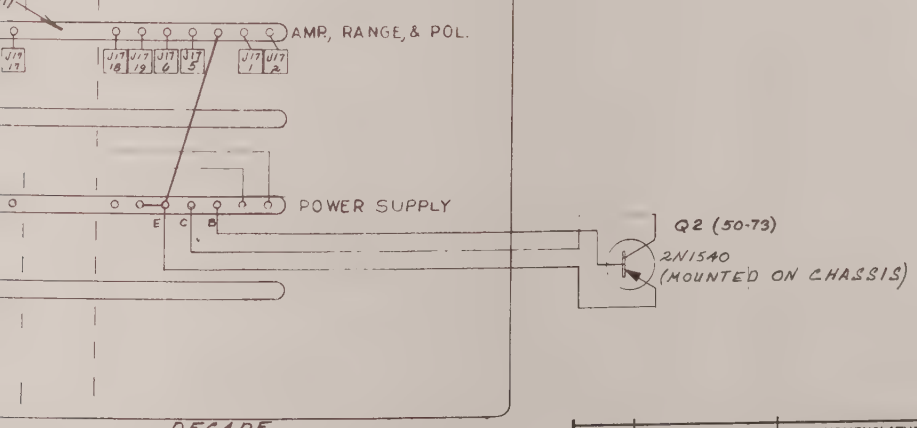


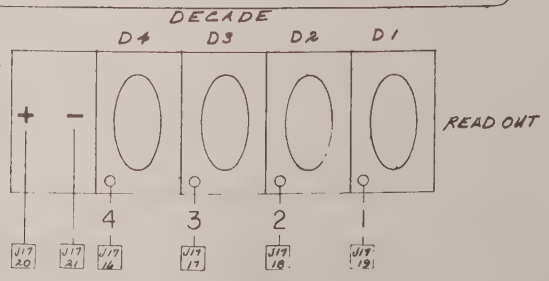
DIETERICH POST CLEARPRINT 1000M-10

REVISIONS					
SYM	ZONE	EFFECT.	DESCRIPTION	DATE	APPROVED
A		ALL	WIRE COMM. J17 TO J16 CHG. FROM J16-1 TO J16-1	3-4-65	R.T.W.





50-74
A



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MFR. CODE	CIRCUIT REF.	ITEM NO.	NEXT ASSY.	FINAL ASSY.	NEXT ASSY.	FINAL ASSY.
		PARTS LIST				50-28	50-28	1	1
						APPLICATION		QTY.	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS ± .010 | ANGLES ± 0° 30'
FRACTIONS ± 1/32
SURFACE ROUGHNESS PER MIL-STD-10 ✓
DO NOT SCALE THIS DRAWING
RELEASE DATE 4-28-65

DRAWN J.A.COMBS
CHECK [signature] 4-16-65
APPR R.T.W. 4-27-65
MATERIAL
FINISH

NLS NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA

"SCHEMATIC"
MAIN BOARD
SERIES 5000

CODE IDENT NO. 03626 | SIZE D | 50-74
SCALE | WEIGHT | SHEET 2

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J9

3
11
17
24
30
36
42
48
54
60
67
75
82

J9

7	J17-19	"DEC"
14	J15-1	"0"
21	-2	"1"
27	-3	"2"
33	-4	"3"
39	-5	"4"
45	-6	"5"
51	-7	"6"
57	-8	"7"
64	-9	"8"
72	J15-10	"9"
78		(TYP)

J9

2	J17-18
10	J19-1
16	-2
23	-3
29	-4
35	-5
41	-6
47	-7
53	-8
59	-9
66	J19-10
74	
80	J21-9

J9

5	J17-17
13	J23-1
20	-2
26	-3
32	-4
38	-5
44	-6
50	-7
56	-8
63	-9
71	J23-10
77	

1 2 3

J28

J24

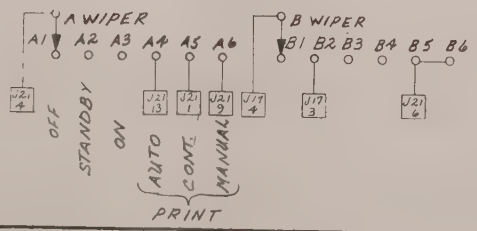
J20

J16

J14 J13

J12 J11

S1 (FUNCTION) (1 WAFER)



REVISIONS					
SYM	ZONE	EFFECT.	DESCRIPTION	DATE	APPROVED

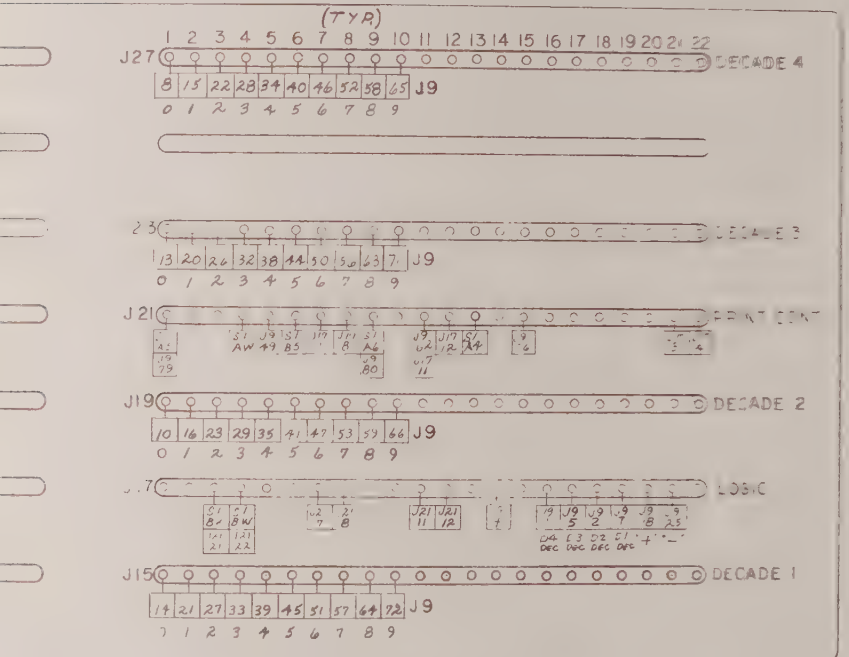
J9	
1	J17-16
8	J27-1
15	-2
22	-3
28	-4
34	-5
40	-6
46	-7
52	-8
58	-9
65	J27-10
73	
79	J21-1

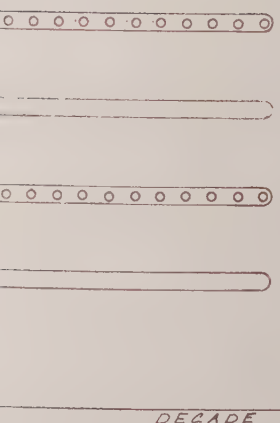
J9	
4	J17-14
12	
18	J17-20 '+
25	J17-21 '-
31	
37	
43	
49	J21-5
55	
62	J21-11
70	
76	J21-15

J9- 201996-1 CONNECTOR
MALE GUIDE SCREW AT 2

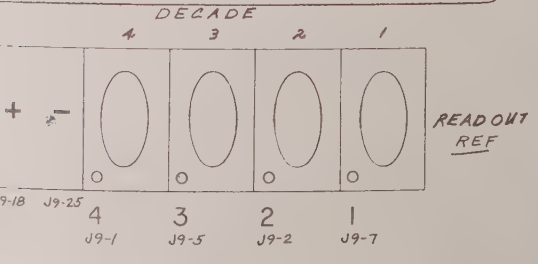
4

(TYP)





50-77



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MFR. CODE	CIRCUIT REF.	ITEM NO.	50-78 NEXT ASSY.	50-78 FINAL ASSY.	1 NEXT ASSY.	1 FINAL ASSY.
		PARTS LIST				APPLICATION		QTY.	

UNLESS OTHERWISE SPECIFIED	DRAWN	A. COMBS	
DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS ± .010 FRACTIONS ± 1/32 ANGLES ± 0° 30'	CHECK		5-10-65
	APPR		5-11-65
	MATERIAL		
SURFACE ROUGHNESS PER MIL-STD-10 ✓	FINISH		
DO NOT SCALE THIS DRAWING			
RELEASE DATE 5-11-65 (2)			

NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA

SCHEMATIC
ADDITION FOR "DVL" PRINT CONTROL
SERIES 5000

CODE IDENT NO.	SIZE	
03626	D	50-77
SCALE	WEIGHT	SHEET

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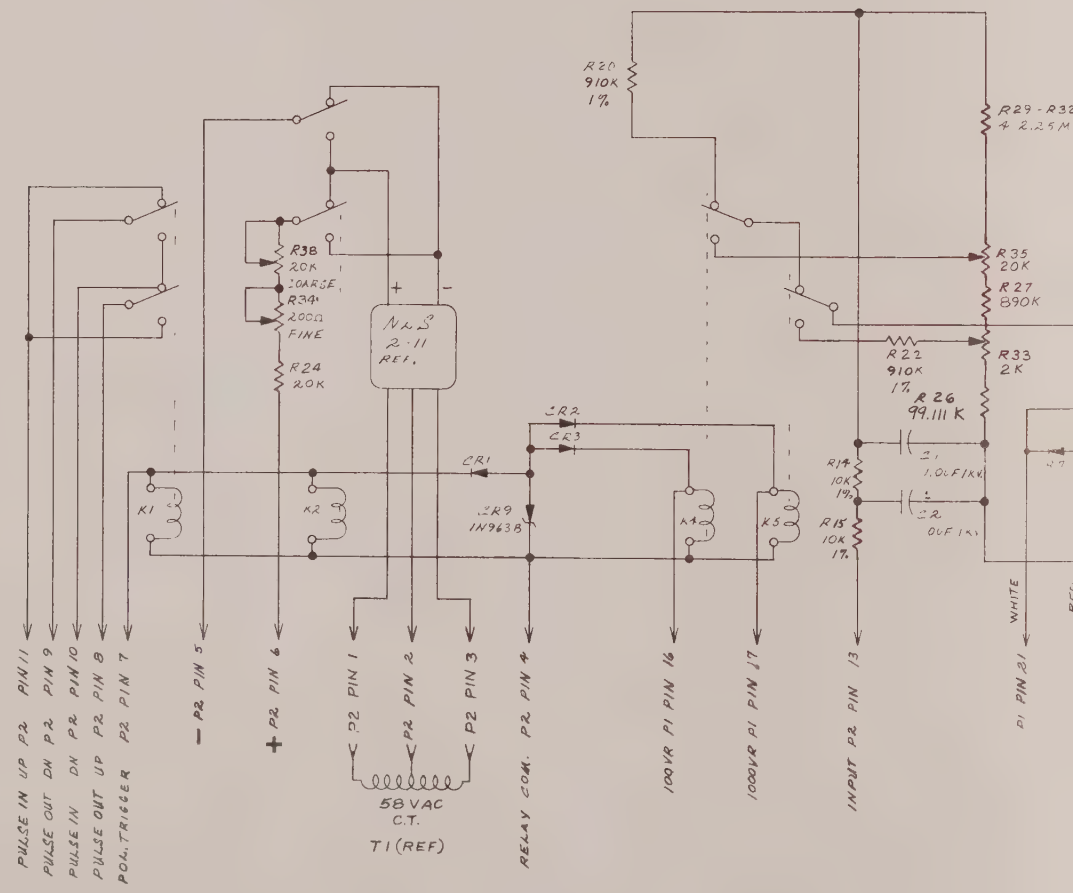
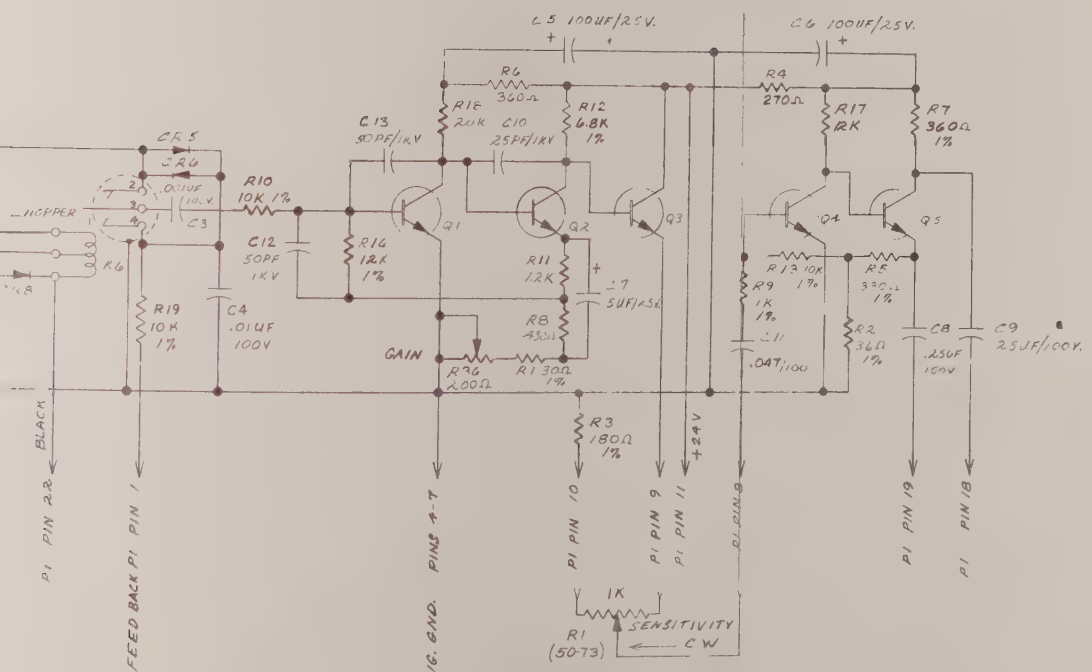


NOTES-
1. RESISTORS R1-R22 ARE 1/2 W 1% GENERAL PURPOSE; R23-R25 PW 1220; R26-R32 PW 2016.
2. DIODES CR1-3, 5-8 ARE 5003-002 (UG 315).
3. ALL TRANSISTORS ARE T1 418 Q1-Q5.
4. ALL RELAYS ARE PRINTACT 12BW3G K1, 2, 4, 5

DIETERICH-POST CLEARPRINT 1000H 10

REVISIONS					
SYM	ZONE	EFFECT.	DESCRIPTION	DATE	APPROVED



50-115 S/2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MFR. CODE	CIRCUIT REF.	ITEM NO.	50-17 NEXT ASSY.	50-17 FINAL ASSY.	NEXT ASSY	FINAL ASSY
PARTS LIST						APPLICATION		QTY.	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS ± .010 | ANGLES ± 0° 30'
FRACTIONS ± 1/32
SURFACE ROUGHNESS PER MIL-STD-10 ✓
DO NOT SCALE THIS DRAWING
RELEASE DATE

DRAWN 5-20-65
CHECK
APPR
MATERIAL
FINISH

NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA

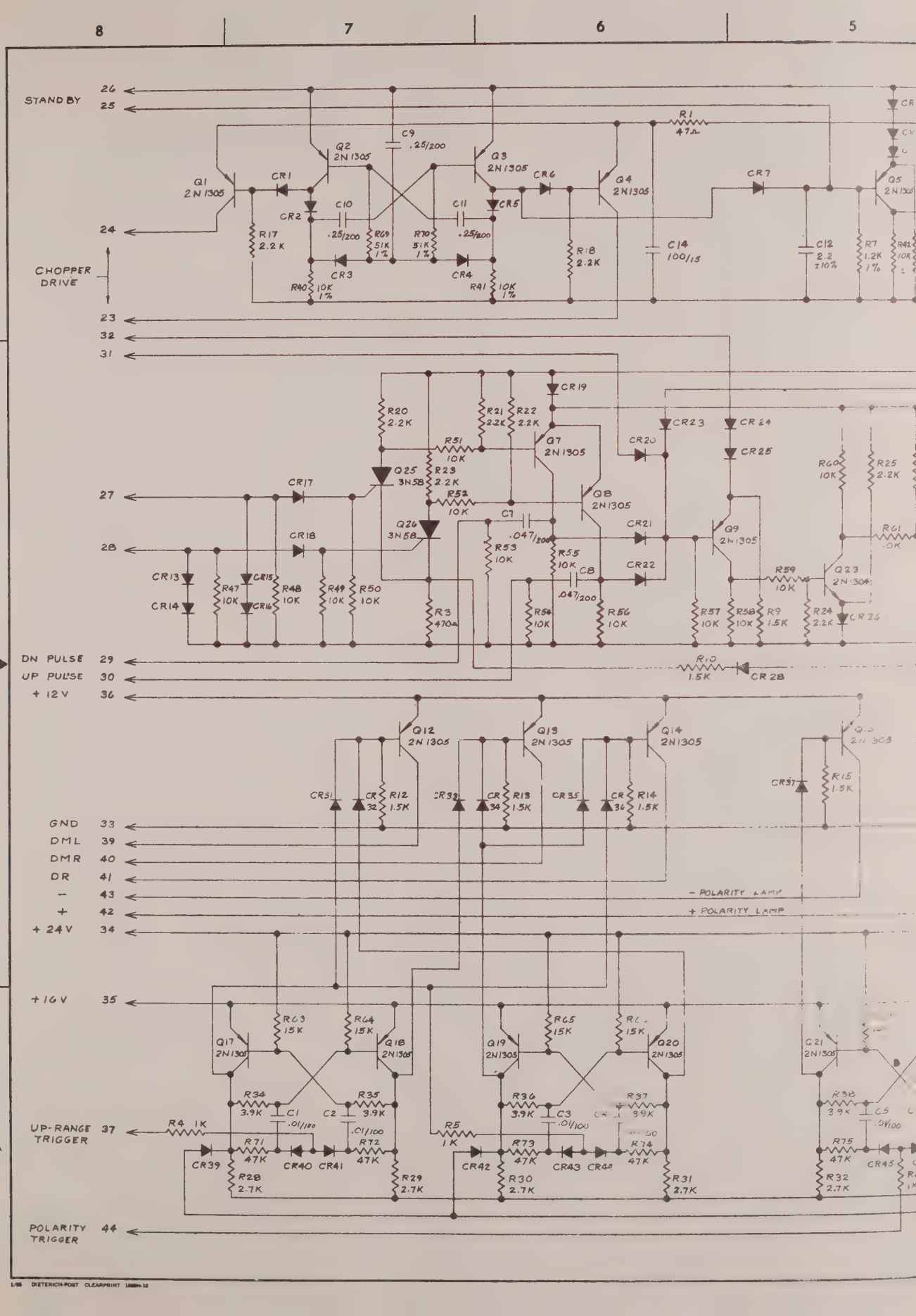
SCHEMATIC

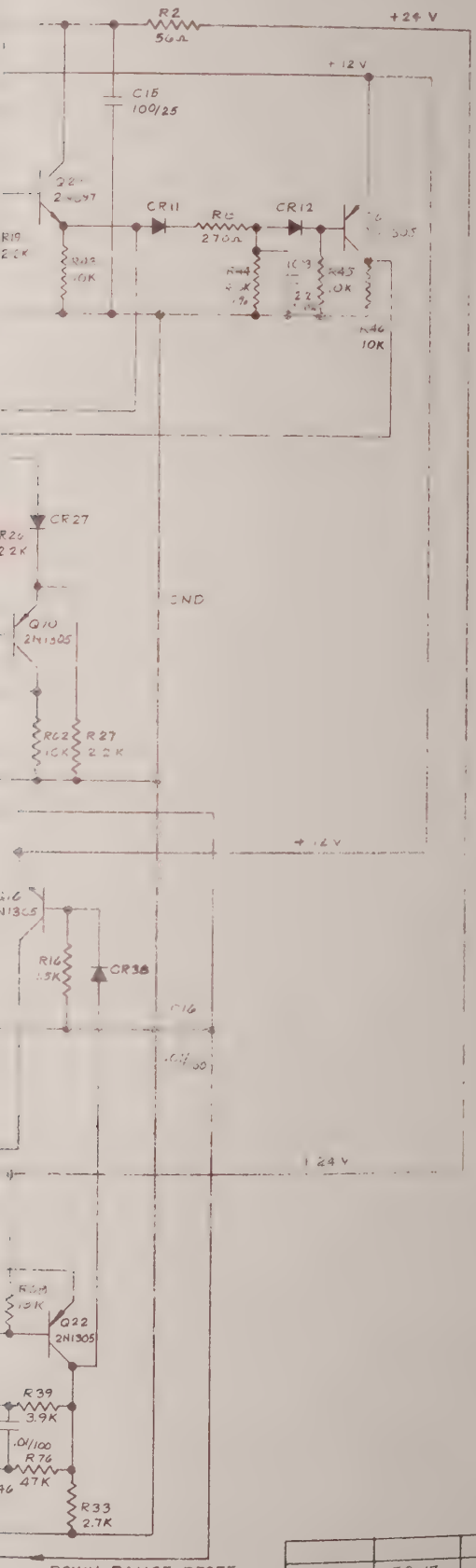
AMPLIFIER, RANGE, & POLARITY

3000 SERIES

CODE IDENT NO. 03626 | SIZE D | 50-115

SCALE | WEIGHT | SHEET 2


8
7
6
5
D
C
B
A
STAND BY
26
25
24
CHOPPER DRIVE
23
32
31
27
28
DN PULSE
29
UP PULSE
30
+ 12V
36
GND
33
DML
39
DMR
40
DR
41
–
43
+
42
+ 24V
34
+ 16V
35
UP-RANGE TRIGGER
37
POLARITY TRIGGER
44
Q1 2N1305
Q2 2N1305
Q3 2N1305
Q4 2N1305
Q5 2N1305
Q7 2N1305
Q8 2N1305
Q9 2N1305
Q12 2N1305
Q13 2N1305
Q14 2N1305
Q17 2N1305
Q18 2N1305
Q19 2N1305
Q20 2N1305
Q21 2N1305
Q25 3N58
Q26 3N58
Q23 2N1304
R1 47Ω
R3 470Ω
R4 1K
R5 1K
R9 1.5K
R10 1.5K
R12 1.5K
R13 1.5K
R14 1.5K
R15 1.5K
R17 2.2K
R18 2.2K
R20 2.2K
R21 2.2K
R22 2.2K
R23 2.2K
R24 2.2K
R25 2.2K
R28 2.7K
R29 2.7K
R30 2.7K
R31 2.7K
R32 2.7K
R34 3.9K
R35 3.9K
R36 3.9K
R37 3.9K
R38 3.9K
R40 10K 1%
R41 10K 1%
R42 10K
R47 10K
R48 10K
R49 10K
R50 10K
R51 10K
R52 10K
R53 10K
R54 10K
R55 10K
R56 10K
R57 10K
R58 10K
R59 10K
R60 10K
R61 10K
R63 15K
R64 15K
R65 15K
R69 51K 1%
R70 51K 1%
R71 47K
R72 47K
R73 47K
R74 47K
R75 47K
R7 1.2K 1%
R12 2.2K ±10%
R14 100/15
C1 .01/100
C2 .01/100
C3 .01/100
C5 .01/100
C7 .047/200
C8 .047/200
C9 .25/200
C10 .25/200
C11 .25/200
CR1
CR2
CR3
CR4
CR5
CR6
CR7
CR13
CR14
CR15
CR16
CR17
CR18
CR19
CR20
CR21
CR22
CR23
CR24
CR25
CR26
CR28
CR31
CR32
CR33
CR34
CR35
CR36
CR37
CR39
CR40
CR41
CR42
CR43
CR44
CR45
– POLARITY LAMP
+ POLARITY LAMP



REVISIONS					
ZONE	LTR.	EFFECT.	DESCRIPTION	DATE	APPROVED

4. TRANSISTOR 2N404A MAY SUBSTITUTE FOR 2N1305 Q12 THRU Q16
3. CAPACITANCE VALUES ARE STATED IN MICROFARADS.
2. RESISTORS ARE ½W 5% OR AS NOTED.
NOTES- 1. DIODES ARE TEXAS INST. UG315 (5003-002).

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MFR. CODE	CIRCUIT REF	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED		CONTR. NO.	
DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS ± .010 ANGLES ± 0° 30' FRACTIONS ± 1/32		DRAWN	5-19-65
		CHECK	
		APPR	5-19-65
MATERIAL		RELEASE DATE	5-20-65

NON-LINEAR SYSTEMS, INC.
DEL MAR, CALIFORNIA

SCHEMATIC- LOGIC ASSY

SERIES 5000 - MODEL 5010

SIZE	CODE IDENT NO.	50-116
D	03626	

SCALE | WEIGHT | SHEET 2 OF 2

50-17	50-17	1	1
NEXT ASSY.	FINAL ASSY.	NEXT ASSY.	FINAL ASSY
APPLICATION		QTY.	

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408-241-0200

California, South Pasadena
1015 Fremont - Box 338
213-682-3705

Colorado, Denver
Box 7184 - Park Hill Station
303-322-3273

Florida, Orlando
705 W. Colonial Drive
305-123-8901

Illinois, Chicago
1915 N. Harlem Avenue
312-889-1277

Indiana, Martinsville
P.O. Box 497
317-342-6045

Massachusetts, Waltham
235 Bear Hill Road
617-899-1430
TWX: 617-894-0748

Michigan, Detroit
26847 Grand River Avenue
313-531-1403

New Jersey, Caldwell
387 Passaic Avenue
201-228-2525

New Jersey, Cherry Hill
1500 Kings Highway
609-428-1663

New Mexico, Albuquerque
505-265-4887

New York, Fishkill
167 Main Street
914-896-6294

New York, Jericho
50 Jericho Turnpike
516-333-7020
TWX: 516-333-8548

New York, Syracuse
East Molloy Road
315-454-9304

Ohio, Dayton
2533 Far Hills Avenue
513-298-8638

Pennsylvania, Pittsburgh
201 Penn Center Blvd.
412-824-1800

Texas, Dallas
8428 Kate Street
214-363-5533
TWX; 214-899-8051

Virginia, Arlington
1008 N. Randolph Street
703-524-4732

Washington, Bellevue
208 Carlson Bldg.
206-454-9332

CANADA: Please contact U.S.A. office nearest you; either Jericho, New York; Detroit, Michigan; or Bellevue, Wash.

OVERSEAS: NLS is represented in many countries. Please consult factory in Del Mar, California.

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systems, inc.

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